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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,701	08/03/2006	Klaus-Robert Muller	0179-0247PUS1	9571

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EXAMINER
OLSEN, LIN B

ART UNIT	PAPER NUMBER
3661	

NOTIFICATION DATE	DELIVERY MODE
12/28/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/549,701	MULLER ET AL.	
	Examiner	Art Unit	
	Lin B. Olsen	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/19/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claim 5, elements a – d are not supported by the specification.

In claim 6, elements a – d are not supported by the specification.

In claim 7, elements a – f are not supported by the specification.

In claim 8, elements a – e are not supported by the specification.

In claim 9, elements a – f are not supported by the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In independent claim 1, "a measurement technique" is specified, but the specification does not identify a measurement technique suitable for the environment. The nature of the invention is to extend the boundaries of conventional brain/computer interfacing beyond the confines of the laboratory. While the state of the prior art is well adapted to the laboratory or working with paralyzed patients, it is new to take the techniques into the dynamic environment of driving a car. While well educated researchers are ones of ordinary skill in the art, the level of predictability in the art is not high. The author does not supply direction as to what is being measured and how. Further, working examples of predicting the actions of dynamic subjects are not provided. Taking all these Wands' factors into account, the examiner believes that one with ordinary skill in the art could not implement the invention without undo experimentation.

Further, the specification does not detail how the "intention of the occupant" is determined by real-time analysis of cerebral-current signals. In paragraph 25, the specification recites "use is made e.g. of the multi-channel EEG with a time resolution in the milliseconds range. The methodological approach is based on robust algorithms of machine learning and signal processing for extraction, identification and classification of

EEG cerebral signals which represent intentions of natural motions in psychophysiologically well-defined interaction situations between humans and the environment." And in paragraph 29 the specification recites "Due to the BBCI real-time suitability, the EEG correlatives--identifiable as individual events--of intention generation and specific motion preparations can serve as a novel input value for concepts of accident-preventive safety,". However neither of these statements is sufficient for one with ordinary skill in the art to discern an occupant's intention with respect to driving a vehicle without undo experimentation.

Lastly, in claim 12 the measures to be taken are based on an "averaging of the intentions of a plurality of vehicle occupants." The specification provides no basis for discriminating between divergent intentions and congruent intentions among the occupants of the vehicle. Although the papers referenced in ¶ 25 may provide the detail needed, these papers cannot provide the necessary enablement, both because they have not been incorporated by reference and because they would contain material deemed essential for the enablement, which cannot be incorporated by reference to a other than a patent or patent publication.

Claims 8 and 9 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for some machine learning methods (3) and accident-preventive measures(9), does not reasonably provide enablement for "generally, all linear and non-linear classification methods for the features obtained by signal processing" and "all predicative safety measures". The specification does not

enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. It is unclear what classification is provided by all linear and non-linear classification methods. It is further unclear what predicative safety measures beyond seat belt tightening, seat optimization, preparing the vehicle for braking/steering operations, computing stability and pre-optimizing the vehicle dynamics for time critical decisions are intended.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3 and 9, the phrase "e.g." (for example) renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 - are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,349,231 to Musha (hereafter referred to as Musha) in view of U.S. Patent No. 6,293,361 to Mueller (hereafter referred to as Mueller) Musha is concerned with an apparatus and method for determining the present will of a subject. Mueller is concerned with sensing changes in bodily reactions in an automobile.

Regarding independent **claim 1**, - A method for initiating occupant-assisted measures inside a vehicle, particularly a motor vehicle, - while Musha describes a procedure for activating occupant support devices in a vehicle col. 7, lines 12-26 - wherein

cerebral-current signals of at least one vehicle occupant, particularly of the driver, are detected by a measurement technique, - Musha monitors cerebral-current signals with a measurement technique, in particular sensors – see Fig.1 col. 2 lines 47-53. While Musha does not monitor signals in a motor vehicle, Mueller monitors bodily reactions in a motor vehicle. The known work in monitoring bodily reactions in a motor vehicle would prompt variations in the field of cerebral–current sensing in the same field to move it toward actions in a vehicle based on incentives to improve safety, since the changes would have been predictable to one of ordinary skill in the art at the time of the invention.

on the basis of the cerebral-current signals, the intention of the vehicle occupant is estimated or detected by real-time processing, and - See Fig 2, wherein the present will of subject is determined. Further, at col. 7, lines 2-7 it is indicated that the training may not be needed for each subject.

on the basis of the intention of the vehicle occupant, measures for transferring the current state of the vehicle into a state of the vehicle matched to the intention of the vehicle occupant are initiated in advance. – at col. 7 lines 12-20, Musha indicates that the controller analyzing the signals can operate an external device which is what is needed to change the state of a vehicle.

Regarding **claim 2**, which is dependent on claim 1, characterized in that the physiological signals are detected non-invasively. - Musha shows sensors non invasively attached to the subject in Fig. 1. col. 2, lines 8-12.

Regarding **claim 3,** which is dependent on claim 1 or 2, characterized in that the cerebral-current signals are cerebral signals such as e.g. EEG, MEG, NIRS, fMRI and/or EMG. – Musha characterizes signals using EEG – see col. 2 lines 54-61.

Regarding **claim 4**, which is dependent on claim 1, characterized in that the real-time processing of the measurement signals is performed by use of methods of signal processing and/or machine learning which allow an evaluation of the measurement signals as individual signals - The specification uses "individual signals" to mean

signals from a single (short time) reading as opposed to signals from over a time period, within that meaning, Musha, as shown in Fig.2 takes a reading of a set of signal and evaluation of those signals using signal processing as detailed in col. 2 line 62 to col. 3 line13. - and without extensive training of the occupant of the vehicle. - at col. 7, lines 2-7 it is indicated that the training may not be needed for each subject.

Regarding claim 5, which is dependent on claim 4, characterized in that the methods for signal processing for adaptive feature extraction from the measurement signals comprise, alternatively or in any desired combination, at least one of the following features:

a) filtration (spatial and in the frequency range) and downsampling,

b) splitting and projection, respectively,

c) determination of spatial, temporal or spatio-temporal complexity dimensions,

d) determination of coherence dimensions (related to phase or band energy) between input signals. – Musha describes a procedure for the determination of coherence masses based on the base load between input signals at co. 4, lines 24-67.

Regarding claim 6, which is dependent on claim 5, characterized in that the filtration comprises, alternatively or in any desired combination, at least one of the following features:

a) wavelet or Fourier filter (short-time),

b) FIR or IIR filter,

c) Laplace and common average reference filter,

d) smoothing method. - Musha teaches separating the signals into wave types based on filtering the signals – Col. 4, lines 55-60.

Regarding claim 8, which is multiply dependent on claim 4 or any one of the preceding claims as far as dependent on claim 4, characterized in that the machine learning method comprises a classification and/or regression, notably by use of

a) core-based linear and non-linear learning machines (e.g. support vector machines, Kern Fisher, linear programming machines),

b) discriminance analyses,

c) neuronal networks,

d) decision trees,

e) generally, all linear and non-linear classification methods for the features obtained by signal processing. - Musha uses neural networks as the machine learning method – see col. 3 lines 17-37 and col. 5, lines 21-31.

Regarding claim 9, which is dependent on claim 1, characterized in that the initiating measures are accident-preventive measures such as e.g.

a) automatic safety belt tightening,

b) seat optimization,

c) optimization of the vehicle reagibility to prepare a braking/steering operation,

d) stability computations,

e) pre-optimization of the vehicle dynamics in case of time-critical decisions,

f) all predicative safety measures. – Musha does not initiate safety measures, but Mueller at col.3 lines 32-37 indicates that automatic operation of a belt tightening device could be a response to identification of the signals.

Regarding claim 10, which is dependent on claim 1, characterized in that the intention or estimated on the basis of the cerebral-current signals serves for the verification of device-detected hazard situations, particularly by detection of a congruent motor intention build-up and situation modeling and validating. – Musha does not correlate motor intention with cerebral current signals, but Mueller at col. 4, lines 11-25 verifies the intention detected by sensors 30 with actions taken by the subject in breaking the vehicle.

Claim is rejected under 35 U.S.C. 103(a) as being unpatentable over Musha/Mueller as applied to claims 1-6 above, and further in view of U.S. Patent Publication No. 2002/0077534 to DuRousseau (hereafter referred to as DuRousseau). DuRousseau is concerned with hands-free interfaces to people.

Regarding claim 7, which is dependent on claim 5, characterized in that the splitting and projection, respectively, comprises, alternatively or in any desired combination, at least one of the following features:

a) independent component analysis and main component analysis,

b) projection pursuit technique,

c) sparse decomposition techniques,

d) common spatial patterns techniques,

e) common substance decomposition techniques,

f) (Bayes') sub-space regularization techniques. – Neither Musha nor Mueller explicitly cite using the above techniques for feature extraction. However, DuRousseau, in processing signals from cognitive sensors, lists spatial, frequency and/or wavelet filtering as processes to be applied to the signals. It would have been obvious to one of ordinary skill in the art at the time of the invention to use these known techniques to improve the brain wave monitoring of Musha along with the processing detailed to gain more precise indications of the intention of the subject,

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Musha/Mueller as applied to claims 1-6 above, and further in view of U.S. Patent No. 5,311,877 to Kishi (hereafter referred to as Kishi). Kishi monitors brain waves to determine wakefulness.

Regarding claim 11, which is dependent on claim 1, characterized by use and integration continuous vigilance monitoring. – The claim is interpreted as meaning that the technique is integrated with a continuous monitoring of the subject for wakefulness. Neither Musha nor Mueller test for vigilance. However, Kishi teaches monitoring a driver for wakefulness Fig.1 and col. 2, lines 59-69. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the prior art elements

of monitoring for wakefulness according to known methods to yield results of anticipating the driver's intention and maintaining the driver's wakefulness.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Pub. No. 2004/0097824 to Kageyama for a control apparatus using brain wave signals and U.S. Patent No. 5,687,291 to Smyth for methods of estimating cognitive decision made in response to a stimulus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin B. Olsen whose telephone number is 571-272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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THOMAS BLACK
SUPERVISORY PATENT EXAMINER